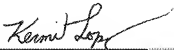Doc Code: AP.PRE.REQ

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# PRE-APPEAL BRIEF REQUEST FOR REVIEW

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| **PRE-APPEAL BRIEF REQUEST FOR REVIEW** | Docket Number (Optional) 1000-1215 |

| I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR | Application Number 10/748,546 | Filed 12/30/2003 |
|---|---|---|
| on _____ | First Named Inventor Alex Nugent | |
| Signature _____ | | |
| Typed or printed name | Art Unit 2129 | Examiner Joseph F Hirl |

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal.

The review is requested for the reason(s) stated on the attached sheet(s).
Note: No more than five (5) pages may be provided.

I am the

[ ] applicant/inventor.

[ ] assignee of record of the entire interest.
See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed.
(Form PTO/SB/96)

*Signature*
**KERMIT LOPEZ**
Typed or printed name

[✓] attorney or agent of record.
Registration number **41,953**

**505-314-1312**
Telephone number

[ ] attorney or agent acting under 37 CFR 1.34.
Registration number if acting under 37 CFR 1.34 _____

**Dec. 7, 2007**
Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required.
Submit multiple forms if more than one signature is required, see below*.

| | |
|---|---|
| [✓] *Total of **1** forms are submitted. | |

# IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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|---|---|
| **APPLICANT:** Alex Nugent | **EXAMINER:** Joseph P Hirl |
| **SERIAL NO.:** 10/748,546 | **GROUP:** 2129 |
| **FILED:** 12/30/2003 | **ATTY DKT NO.:** 1000-1215 |

**TITLE:** **PHYSICAL NEURAL NETWORK LIQUID STATE MACHINE UTILIZING NANOTECHNOLOGY**

**Please forward all correspondence to:**
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PO Box 4484
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Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

## REASONS FOR PRE-APPEAL BRIEF REQUEST FOR REVIEW

Dear Sir:

In response to the Final Office Action dated September 11, 2007 and in support of the "Pre-Appeal Brief Request for Review" in the above captioned matter, Applicant submits that the Applicant's arguments/amendments presented in the response dated July 25, 2007 regarding claims 21-40 are persuasive and do place the claims in condition for allowance.

In the Final Office Action dated September 11, 2007, the Examiner requested detailed test data pursuant to CFR §1.105. The Examiner stated failure to produce such data will result in the assumption the invention has not been reduced to practice. The Applicant cites MPEP 2138.05 as follows:

### 2138.05 "Reduction to Practice" [R-5] - 2100 Patentability

Reduction to practice may be an actual reduction or a <u>constructive</u> reduction to practice which occurs when a patent application on the claimed invention is filed. The filing of a patent application serves as conception and constructive reduction to practice of the subject matter described in the application. Thus the inventor need not provide evidence of either conception

or actual reduction to practice when relying on the content of the patent application. *Hyatt v. Boone*, 146 F.3d 1348, 1352, 47 USPQ2d 1128, 1130 (Fed. Cir. 1998).

Thus, the filing of Applicant's patent application is evidence of a reduction to practice, being a constructive reduction to practice. However, the Hong reference cited herein provides further evidence that nanoconnections can be formed in a solution and attracted to a connection gap (rather than electrodes) to form such connections.

Regarding the rejection of claims 21-40 based on 35 USC § 112 as failing to comply with the enablement requirement, Applicant's invention is enabled by the specification. The Hong reference, which post-dates Applicant's invention and is therefore not prior art, and which Applicant previously described in response for the Examiner's for additional information in prior office actions, describes that charged nanoparticles suspended in a liquid dielectric solution may be attracted to the gap between the electrodes. The Hong reference demonstrates that this physical phenomenon is based on practical principals. This is further displayed by a cursory investigation into the field of negative dielectrophoresis, whereby certain electrode geometries can be used to trap non-charged particles while never touching the electrodes.

Applicant's specification offers an ample explanation of how such a physical system can be used to create a physical neural network. Paragraph 0082 of Applicant's specification, for example, provides a generalized description of how Applicant's physical neural network is constructed. And as promised in paragraph 0082, the specification continues with specific details related thereto. Thus, Applicant's specification would enable one skilled in the art to make or use Applicant's invention.

Further, in the Final Office Action dated September 11, 2007, the Examiner rejected the claims based on 35 USC §112, first paragraph as failing to comply with the written description requirement. Specifically, the Examiner argued "while control of the electrical characteristics might be helpful, one has to first have the basis of the neural network..." Again, the

specification provides ample detail of the neural network involved in Applicant's invention.

Regarding the Prior Art Anticipation argument of the Examiner in the Final Office action dated September 11, 2007, the Examiner failed to indicate under which specific section of 35 USC §102 this discussion relates.

Additionally, as indicated in the Amendments and Reply to Office Acton dated July 25, 2007, the reference by Paul M. Adriani and Alice P. Gast entitled "Electric-field-induced aggregation in dilute colloidal suspensions" (hereinafter referred to as Adriani) cited by the Examiner relate to the formation of "chains". The Applicant is not developing electric-field induced chain formations. Rather, nanoconductors are attracted to the connection gap as described in claim 21 excerpted below:

> a liquid dielectric solution comprising a mixture of a plurality of nanoconductors and a liquid dielectric solvent, wherein said plurality of nanoconductors are located in and free to move about within said liquid dielectric solution, said liquid dielectric solution disposed in said connection gap between said at least one pre-synaptic electrode and said at least one post-synaptic electrode.

Further, The Examiner argued the Applicant did not define the term Nanotechnology in spite of paragraph 16 of the Applicant's specification:

> The term "Nanotechnology" generally refers to nanometer-scale manufacturing processes, materials and devices, as associated with, for example, nanometer-scale lithography and nanometer-scale information storage. Nanometer-scale components find utility in a wide variety of fields, particularly in the fabrication of microelectrical and microelectromechanical systems (commonly referred to as "MEMS"). Microelectrical nano-sized components include transistors, resistors, capacitors and other nano-integrated circuit components. MEMS devices include, for example, micro-sensors, micro-actuators, micro-instruments, micro-optics, and the like.

The Examiner has rejected the Applicant's prior arguments that "Nanotechnology" is adequately defined by this paragraph. The Examiner claimed $X*10^{-9}$ represents a nanometer scale where X could be any real number thus rendering the scale meaningless. While the Applicant accepts this as a general mathematical truism, taken to its logical conclusion, this would render all SI prefixes worthless in any descriptive capacity. The Applicant asserts this interpretation is unreasonably broad. A more

reasonable interpretation fits with the definition given in paragraph 16 of the specification; where such an SI prefix is used to describe scale.

The Adriani reference specification indicates the following dimensions:

"We measure suspension conductivity...in a stainless steel Couette cell of a 13 mm cylinder with a 12 mm radius and a gap of ca. 0.5 mm"

This is <u>not</u> a <u>nanometer-scale</u> device. Instead these dimensions (millimeters) are much larger. Thus, Adriani is <u>not</u> a nanotechnology-based device. Because, Adriani is <u>not</u> nanotechnology, electroheological fluids are <u>not</u> dielectric in nature, and there is <u>no</u> teaching or hint in Adriani of neural networks, Adriani does not anticipate Applicant's invention.

The Examiner cited Mehrotra, which teaches an artificial or software-based neural network. This is <u>not</u> the same as the physical neural network described by the present invention. The Examiner also cited Therese C. Jordan et al. writing in the IEEE, entitled "Electrorheology". This reference is intended to show the present invention will not function. The Examiner argued the Applicant has not provided test data evidence that chains do not form. However, the claims of the present invention are based on physical phenomena more accurately described by the Hong reference. This represents affirmative evidence that such chains do <u>not</u> form. As such, the Applicant simply asserts, in light of the evidence demonstrated by Hong reference (which was provided to the Examiner at the Examiner's request) and Applicant's specification, the Examiner has <u>failed</u> to establish the invention will <u>not</u> function as a physical neural network.

Regarding the rejections of claims 21-41, based on 35 USC § 101 (and the correlated 112 rejections), the Applicant reiterates the invention can function as a neural network and the invention is in no way based on "chains", as described by the references the Examiner has cited. To the contrary, the present invention could not operate as described if "chains" were formed.

Regarding the rejection of claims 21-41 based on 35 USC §102/103, the Examiner argued the claims as written have no basis in reality and cannot be evaluated because the invention does not and cannot exist. The
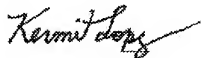
above arguments speak for themselves and are equally applicable to this rejection.

Finally, in addition to the foregoing discussion based on the Examiner's most recent rejections in the Final Office Action dated September 11, 2007, the Applicant would like to briefly address another issue.

The Examiner, in prior office actions, repeatedly demonstrated a serious misunderstanding of what constitutes a "liquid state machine". The Examiner seems to have incorrectly equated the liquid dielectric in the present invention with the "liquid" in a liquid state machine; an analogy that is simply incorrect. Again, as the Applicant has previously attempted to point out in prior responses, the term "Liquid" in "Liquid State Machine" is a metaphor for a dynamic system with a fading analog temporal memory...much like the surface of a liquid after a surface disturbance. The Examiner seems to have reverted to the current line of argumentation suggesting the Applicant's invention "cannot work", after realizing the futility of the arguments based on liquid state machines.

In view of the foregoing discussion, the Applicant respectfully requests the withdrawal of the rejections under 35 U.S.C. 102 and hence, 35 U.S.C. 103. Reconsideration and allowance of Applicant's application is respectfully solicited.

Respectfully submitted,

Dated: December 7, 2007

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